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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/945,553

08/30/2001

Fernando Gonzalez

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1842

21186

7590

04/07/2004

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EXAMINER

FOURSON III, GEORGE R

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/945,553

Applicant(s)

GONZALEZ ET AL.

Examiner

George Fourson

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-66 is/are pending in the application.
- 4a) Of the above claim(s) 2-4, 7, 8, 13, 16, 23-30 and 34-66 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 5, 6, 9-12, 14, 15, 17-22 and 31-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Applicant's election of the invention of species I wherein the conditions comprise presence of a gaseous F containing compound in Paper No. 20040112 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 1,5,6,9-12,14,15 and 17-22 are seen to either read on or be generic to the elected species. The remaining claims require a solid F containing compound and/or require etching under conditions that reduce redeposition of volatilized metal.

Claims 31-33 link(s) inventions I and II. The restriction requirement between the linked inventions is subject to the nonallowance of the linking claim(s), claims 31-33. Upon the allowance of the linking claim(s), the restriction requirement as to the linked inventions shall be withdrawn and any claim(s) depending from or otherwise including all the limitations of the allowable linking claim(s) will be entitled to examination in the instant application. Applicant(s) are advised that if any such claim(s) depending from or including all the limitations of the allowable linking claim(s) is/are presented in a continuation or divisional application, the claims of the continuation or divisional application may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Where a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. *In re Ziegler*, 44 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

There is no antecedent basis for "metal nitride barrier layer". It appears that "metal nitride" should be deleted in view of claim 19.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,5,6,9-12,14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of applicant's admitted prior art (AAPA) and Mitani et al.

Applicant admits in the instant specification, pages 1-3, formation of a polycide gate stack followed by patterning and oxidation of the polysilicon portion of the stack. The process of AAPA does not include presence of gaseous  $\text{NF}_3$ .

Mitani et al discloses oxidation of polysilicon gate material in an ambient comprising  $\text{NF}_3$  as a method of introducing F into the channel region of a MOSFET (col.41, lines 12-18).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of AAPA and Mitani et al to enable the oxidation step of AAPA to be performed and further to achieve the introduction of F according to the teachings of Mitani et al.

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Claims 17 and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in combination with Mitani et al as applied to claims 1,5,6,9-12,14 and 15 above, and further in view of Cunningham.

AAPA in combination with Mitani et al does not include sidewall formation or metal nitride barrier layer formation.

Cunningham discloses sidewall formation after polysilicon oxidation and metal nitride barrier layer formation in a polycide gate formation process (abstract and [0030]).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of AAPA, Mitani et al and Cunningham to enable the polycide gate structure of AAPA to be formed according to the teachings of Cunningham related to obtaining greater tolerance to higher temperature annealing.

Claims 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in combination with Mitani et al as applied to claims 1,5,6,9-12,14 and 15 above, and further in view of Jain et al.

AAPA and Mitani et al do not disclose presence of  $\text{NF}_3$  during gate patterning.

Jain et al discloses patterning of layers to form a polycide gate electrode using  $\text{NF}_3$  gas (col.2, lines 13-22).


It would have been within the scope of one of ordinary skill in the art to combine the teachings of AAPA, Mitani et al and Jain et al to enable the step of patterning the gate stack of AAPA to be performed and furthermore to enable removal of the ARC as disclosed by Jain (see abstract).

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Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956 until 2/4/04. See MPEP 203.08.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner George Fourson whose telephone number is (571)272-1860. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (571)272-1855. The fax number for this group is (571)273-0224 and the customer service number for group 2800 is 571-272-2800. Updates can be found at <http://www.uspto.gov/web/info/2800.htm>.

  
George Fourson  
Primary Examiner  
Art Unit 2823

GFourson  
April 5, 2004